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ABSTRACT

A study was conducted to determine the effectiveness of interactive video in teaching study skills and to discover: (1) the overall attitudes of students toward computer-directed instruction (CDI) as compared to traditional teaching methods; (2) whether two groups, instructed via CDI and traditional methods, differed significantly in knowledge of test-taking after the treatment; and (3) whether the two groups differed in the amount of time spent in CDI as opposed to traditional instruction. A total of 32 students enrolled in College of Education study skills classes (16 females, 16 males) were randomly assigned to treatment and comparison groups after a pre-treatment evaluation was conducted to insure that the final groups would not differ significantly in an extraneous variable that might influence the outcome of the study. Treatment consisted of identical content delivered to students via two methods of delivery: traditional instruction and CDI. Following the administration of the treatment, a measure of knowledge acquisition on the lesson on test-taking was administered to both groups. Analysis of the data indicated that: no differences beyond chance were found between the groups on measures of attitude toward computer-directed instruction and traditional teaching approaches; the two groups differed in knowledge of test-taking--students receiving computer-directed training were able to pass the test with a significantly higher score than the comparison group; and the computerized phase took approximately one-half the time required for the traditional lesson. Recommendations for further research and a list of references complete the document. (JB)

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RESULTS OF PILOT STUDY OF PROJECT USING INTERACTIVE VIDEO TO SUPPLANT TRADITIONAL STUDY SKILLS UNIT FOR DEVELOPMENTAL READING STUDENTS.

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CHAPTER I

I. INTRODUCTION

"Communication would include all those processes by which people influence one another . . . . This definition is based on the premise that all actions and events have communicative aspects, as soon as they are perceived by a human being . . . (and) that such perception changes the information an individual possesses and therefore influences him" (J. Ruesch, G. Bateson, 1975, p. 6). It is obvious that although the communication process described above is one immediately familiar to us, it has infinite ramifications for study by many groups of scholars in the complex, computerized communicative environment provided by our twentieth century world.

Communication and human interactions of all types are being effected by electronic-information processing. The long-term affects are only now being considered; the daily changes are more obvious to the observer. However, regardless of whether the future or the present is being examined, technology must be considered in terms of its effect on human

communications and human behavior. Human functions must be examined within the context of existing environments, such as institutions of higher education. The kinds of changes that will affect higher education and all academic disciplines, including counselor education, can only be imagined but it is clear that many changes in human communications and functioning will occur rapidly. Those professors in fields of education who are willing to view change as a challenge rather than a threat will survive and perhaps reach new levels of achievement.

According to Cross (1979):

> There is a special urgency now to experiment with new schedules for adult-learners--ranging all the way from the minor modifications illustrated in evening and weekend colleges to the revolutionary concept of offering college credit for learning done outside the auspices of any college, the fixed time boundaries of higher education are doomed. It is already the norm, rather than the exception, for colleges to grant credit if students can demonstrate on a test that they learned as much through a method of their own choosing as students taking a semester-long course on campus. It is already possible for adults to earn associate and bachelor's degrees completely outside the fixed time boundaries of traditional education. Indeed, in 1976 there were over 200 accredited external degree programs in this country, granting degrees to some 54,000 adults. Most of those adults earned their degrees outside the fences of summer terms . . . . My prediction is that major breakthroughs will occur on these fronts before the turn of the century, and when they

> do, education will take a quantum leap into the future (p. 11).

Becker (1979) illustrates this by predicting that the new student . . . will not really need us; he or she will register by phone, will pay tuition costs using charge cards, will take a complete curriculum of courses by radio or television in the comforts of his or her own living room, and contact with the university will be limited to accumulating credits and graduating with a tele-diploma.

Joseph (1981), staff scientist-futurist for Sperry Univac, stated: "If educators wait 3 to 10 years to use computers in the educational process, public education will be out of business" (p. 17).

Need for the Study

The crisis facing higher education in general has been described by the White House Report, Science and Engineering Education for the 1980s and Beyond, National Science Foundation and Department of Education, October, 1980:

1. Engineering and computer professions are the only areas of undergraduate science enrollment that will have dramatic growth.

2. Student populations are dwindling due to demographic factors and the enormous cost of obtaining a degree in residence.

3. Costs are outstripping income for virtually all colleges and universities because of inflation, a leveling off of income from tuitions and fees, decreasing endowments, and decreased federal support.

4. Faculties will lack the flexibility to pursue innovative research and instruction.

5. Because of tight budgets, courses and curricula are becoming outdated; faculty have decreasing opportunities to keep up with their fields.

In an unpublished paper, G. Marsh has stated:

> that it can be anticipated over the next decade that resources for higher educaton will continue to diminish in terms of real dollars. Current reductions in federal expenditures for higher education and other services will place a demand on state legislatures to replace lost revenues. But, the states also have serious fiscal problems; there will be intense competition for appropriations so that it can be expected that higher education will continue to experience a reduction of state support. Faced with such severe problems, some colleges and universities have already eliminated entire departments and colleges in non-growth areas. Such remedies, however, do not improve resources for education because such measures are stop-gap, they enable universities to only reduce costs, not to improve . . . . In view of the limitations of conventional training and the associated problems identified above, the only means by which graduate production can be increased without increasing faculty size, and

> to insure high educational standards, is to apply technology to teaching.

To date, the impact of technology on education and counseling has been limited to computer-assisted instruction (CAI) which is a very restricted application based mostly on visual and printed images of the computer. CAI is not much different than reading. There is usually no voice presented on the computer program to give the learner or client any direction or feedback. The strength of CAI is that it is rapid, repetitive, and very intense.

CAI is based on interaction. Cronbach (1977) describes CAI as a computer connected with student stations--perhaps by long-distance telephone--which can converse with a hundred or more students at the same time. The student's terminal is likely to be an electric typewriter, which prints questions and accepts answers. Headphones may be added, especially for instruction in language. There may be a picture tube on which are shown letters or diagrams, or perhaps slides. The student answers questions by pushing buttons, or typing an answer or pointing with a wired stylus on a spot on the picture tube. Both the hardware and the software--the apparatus and the programs--vary in complexity and flexibility from one CAI installation to another. Interaction, as described

by CAI, is an exchange between student and teacher. The student responds actively during the whole of his time at the station. In an ordinary class the teacher addresses the student personally only once or twice in a class period. With CAI, he can be addressed a hundred times in a much shorter period, each time with a question requiring a response. A "help" message to the computer brings an immediate hint or explanation. The response is objectively and instantly judged. A right answer is promptly rewarded by "a signal."

The impact of technology can be increased by using it to replace rather than support many educational and counseling-related activities. Rather than computer-assisted instruction, a new approach is needed that will surpass the limitations of CAI and conventional teaching-delivery systems. Computer-directed instruction (CDI) is possible because of the very recent development of interactive boards of microcomputers to control video and peripherals important for comprehensive instruction, and the development of software and authoring languages for use in instructional format. CDI may actually replace the instructor and the scheduled class. CAI has been used in certain universities for many years, but it involved

large computers, remote terminals, and large staffs to develop programs. It did not change education and learning.

Wagman and Kerber (1980) have introduced the PLATO computer-based Dilemma Counseling System (PLATO DCS) which teaches a generic method for solving life-choice problems and counsels persons regarding their current psychological dilemmas. The PLATO DCS components contain 69 representative life-choice problems and over 400 specific and general solutions that assist users in solving their psychological dilemmas. Computer-based dilemma counseling was examined empirically by assessing improvement of self-reported problems in two groups of undergraduate students treated on PLATO DSC (N = 48) or in a non-contact control group (n = 62).

PLATO DSC, an Interactive Computer System for Personal Counseling, differs from CAI in that CAI offers programmed instruction in a planned sequence of explanations and tasks, combining a feedback system and branching systems for modifying the instruction to fit the learner (Cronbach, 1977). PLATO DSC, however, offers the students opportunity to interact with the material through a special keyset that closely resembles a typewriter keyboard, and students receive

essentially instantaneous reinforcement of correct work and assistance where they are having difficulty (Smith & Sherwood, 1976). Students who used PLATO DSC showed significant improvement in the ability to cope with their problems when compared with the control group one week after treatment. Favorable subjective reactions to the teaching and counseling functions of PLATO DSC suggested that a modern computer system can be helpful in solving psychological dilemmas.

Although students reacted favorably to a computer which presented a written test on the monitor, there has been no investigation of a similar system using a stationary picture or video-tape of a human face. The reactions of students to the computer with this variable should be interesting, especially if experimentation is done with visual images depicting people of either sex and various ages. This dimension can be explored more fully because of the very recent development of interactive boards for microcomputers to control video segments. This technological development will "interpose the humanizing qualities of interaction into the computerized schema . . . a quality essential to counseling and guidance" (Marsh, 1981, p. 3).

Although very little research has been conducted to investigate the efficacy of computerized counseling, preliminary evidence indicates that it is a valid technique because subjects respond favorably and report improvement in self-reported problems of adjustment. No research has been conducted on the use of computer controlled video in counseling or instruction (Frank Withrow, U. S. Department of Education, unpublished paper presented to the conference of the Society for the Advancement of Learning Technology, Los Angeles, California, August 1981). This is not surprising because of the recency of the technology permitting the computer to control video presentations or to permit random access of video segments.

It would seem that a preliminary investigation of the reactions of students to computer-controlled video training would be justified and contribute to the body of knowledge. To date, no research has been conducted on this new approach. If this approach is accepted by subjects, it could reduce the workload of the counselor significantly, thus enabling the counselor to engage in more significant aspects of counseling services.

Definition of Terms

Several terms used in this study needed further explanation. They were:

Branch (a computer term) refers to the selection of a particular sequence other than one presented in a linear presentation.

Communication refers to those processes by which people influence one another.

Computer Assisted Instruction (CAI) represents systems that rely on a central processor to store the instructional material and the computer program. Students respond to these remote terminals on a keyboard via the printer.

Interactive refers to a mode of instructional delivery in which the learner actively responds to individual segments of instruction.

Interactive/Board refers to an electronic control mechanism that permits a computer to control peripheral devices.

Interactive Computerized Systems refers to those systems that permit a learner to interact with a program rather than passively attend.

Statement of the Problem

The purpose of this study was to assess the desirability of using videotaped instruction and computer peripherals for teaching study skills courses.

Research Questions

1. What will be the overall attitude of students to CDI (Computer Directed Instruction) as compared to traditional approaches of similar sequences?

2. Will the two groups differ significantly in knowledge of test-taking after the treatment?

3. Will the two groups differ in the amount of time spent in CDI (Computer Directed Instruction) as compared to traditional instruction on a time basis?

Null Hypothesis

There is no difference between the group receiving traditional instruction and the group receiving Computer Directed Instruction (CDI) on a measure of knowledge of content.

CHAPTER II

REVIEW OF LITERATURE

The Evolvement of Technological Instruction

Computers have been "on the scene" in the field of education since the early 1950s with their first appearance in the area of administrative applications. As a guidance tool, computers did not really begin making their presence felt until the late 1960s and early 1970s, primarily in public secondary school settings (Schenk, Murphy & Shelton, 1980).

Bowlsbey (1974) reports that since 1966, approximately 30 computer-based systems have become operational. Of this original number, only a handful of systems have emerged as survivors in the education environment. By and large, these systems have enjoyed positive evaluations (Chapman, Norris, & Kay, 1973; Harris, 1972; Impelleteri, 1968; Maola & Kane, 1976; Melhus, Hershenson, & Vermillion, 1973; Myers, Lindeman, Thompson, & Patrick, 1974; Myers, Thompson, Lindeman, Super, Patrick, & Friel, 1972; Price, 1975; Pyle & Stripling, 1976; Rayman, Bryson, & Bowlsbey, 1978; Sampon & Stripling, 1979). Computer-based

systems have been shown to be enthusiastically accepted by both parents and students, easy to use, capable of generating measurable increases in vocational maturity and occupational knowledge, and preferred by students for obtaining career information instead of books, files, and other traditional information sources.

(Computer Assisted Instruction)

Cronbach (1977) suggests that computer-aided instruction (CAI) is the highest development of instructional technology. The presentation to the student follows a sequence of explanations and tasks, together with a feedback system and, perhaps, a branching system for modifying the instruction to fit the learner.

A planned sequence of displays and rules for judging responses is loaded onto a tape or disk. Once stored, the displays can be delivered in an identical manner to every student, wherever he or she is. Any improvement in the program can affect hundreds of thousands of students. This prospective payoff warrants extended pilot work, first to identify spots where learning does not proceed smoothly and then to test revisions.

Explanations are carefully sequenced, and exercises progress in difficulty. Some instruction is paced so gradually that the student is likely to make few errors.

The program can be "branched" to fit the student. Compared with exercises in printed form, the greatest advantage of the computer is its capacity to adapt. The student begins with exercises thought to be appropriate for his experience, but within a few minutes the computer has obtained evidence that this level is too advanced or too easy. The difficulty level of exercises is shifted up or down until the student is encountering the amount of difficulty that experience has shown facilitates learning. The computer stores information on performance and when the student signs on for another session on a later day, the lesson starts at the right level for him. When the content has been outlined as a hierarchy, the computer will identify a strand of content where the student is especially weak. It chooses exercises to develop competence and ignores the content over which the student has command.

The responses are objectively and instantly judged. A right answer is promptly rewarded by a

signal. When the student completes a whole set of exercises, he or she may receive a message of commendation.

The total amount of instruction can be adjusted. Students who take longer to master fundamentals can be given more time on the machine each day or kept on the program for more days, while the rapid learners are freed to pursue their own projects.

The computer detects errors instantly. The program may call no attention to errors, simply presenting the question again later. Most often, the error is signaled--by a statement of what went wrong, a printout of the intended answer, or a request to try again. The strengths of a standard approach, with either CAI or teletype terminals, are known to be individualized and purported to be interactive.

This aspect is lacking in current CAI programs. As Marsh (1981) points out, because of the very recent development of interactive boards for micro-computers to control video, it is possible to interpose the humanizing qualities of interaction into the computerized schema.

Although CAI may include some graphics materials with special graphic terminals, standard approaches

lack the ability to use the motion picture sound and color format that can be so appealing to the student. Also, these systems have been expensive and require high communication costs when the materials are placed at a distance from the host computer (Heuston, 1977).

The first computer built in 1946 occupied 1,500 square feet, consisted of 18,000 vacuum tubes, cost several million dollars, and required a horde of technicians to keep it running ten minutes a day (Johnson, 1981). The evolution of the microcomputer and the control devices has lowered the expense dramatically and modern engineering permits utilization of powerful, inexpensive tools for counseling that have just emerged.

Video Components and Limitations

Tele-visuals and video components once appeared to have the greatest potential (of any media) for instruction. Corporate use of visual communication (slide shows, film, television) is not new, adds Judy Anderson, director of audio-visual services for the accounting company of Peat Marwick Mitchell & Co. Anderson further says, "We're not using it [sic] because we think it should replace print any more than

Gutenberg thought print would replace talking, we're using it because it's a medium people respond to" (Hunter, 1981, p. 27).

Hunter (1981) also reports that International Paper Co. produced its first paperless annual report. Presentation of the company's 1980 financial highlights, along with discussion of the company's timberland and manufacturing operations were done on a half-hour video cassette. It was made available for 62,000 stockholders and aired over some 225 cable television systems.

Many corporations have begun using video tape--combining with office and home playback equipment; cable television, and satellite "tele-conferencing"--as the new wave of communication to stockholders, customers, employers, and a variety of other audiences. More than 27,000 organizations--at least half of which fit the business and industry category--now use video cassettes in some phase of their day-to-day operations (Hunter, 1981). But, education does not use video to such an extent.

Video has many obvious advantages including the expense of the equipment, the lack of communications costs, and the fact that it is already present in

almost every home. After a number of years of usage, however, there are some fundamental shortcomings in the use of television broadcasting and other video components as an instructional technology. While the technology increased the productivity of the teacher, it is not a very productive approach for the learner. Some of the short-comings are as follows (Hueston, 1977, pp. 44-45):

(a) The learner must arrange his time to be available at the moment the material is being broadcast.

(b) The presentation is in a serial form so that the learner must wait patiently for the appropriate significant moments. Even in reading a newspaper one has random access ability that television lacks.

(c) The learner cannot stop the material and review it if it is suddenly too difficult.

(d) The materials being presented rarely are at the appropriate level for individual needs at that point.

(e) The student cannot <u>interact with the materials and get a response</u> as he or she attemps learning trials.

, It is the interaction of video components with computerized programs that is of primary importance. It can be postulated that interaction, as utilized by the CDI system, is an applicable system that humanizes its technology--a system essential to those interested in technological applications of counseling and guidance.

Interaction System: CDI (Computer Directed Instruction)

Microcomputers have the capability to integrate many media into a mix of delivery to optimize the teaching-learning strategy being used for a given instructional objective. Audio and visual displays of stimulus material can be controlled and managed by microcomputers through simple linkages between the computing hardware and video-disc players. Though the technology for controlling these displays is easy to understand and accomplish, the instructional planning necessary to determine appropriate displays and timing is much more complex and must be made by expert teachers and instructional systems.

At another level, microcomputers are capable of aiding in the management of the total teaching-learning situation, tracking learners' progress, maintaining

records, maintaining inventories of instructional resources, and scheduling learning activities (Eisele, 1981).

> Microcomputers . . . are capable of reducing large, complex electrical circuits, into small, energy-efficient, reliable devices. These circuits may do traditional tasks, such as amplifying or filtering signals, but increasingly microcomputers carry out logical operations on digital signals. Logical operations of the form 'if this occurs, do that' give electronic devices intelligence to respond to changing conditions. Digital coding of information allows great accuracy and flexibility (Johnson, 1981).

Tens of thousands of logical circuits (or storage locations) can be put on a single chip, at a cost that is no more than if only ten circuits were put on.

Because of their small size, microelectronic computers will appear everywhere. Thus, automobiles, television sets, and microwave ovens, and all tools and devices will contain intelligent microelectronic circuits that control operations. Microelectronic devices will appear in light-sensitive light bulbs, climate sensors, and medical alarms attached to clothing and applicatons not yet conceived. The world will be changed dramatically beyond any conventional imagination (Johnson, 1981).

Computer-directed instruction combines the use of video components with computer peripherals (Marsh,

1981). Computer instruction alone offers (Cronbach, 1977):

1. individualized instruction.
2. instruction that is carefully sequenced and paced.
3. a program capable of "branching."
4. instant feedback.
5. adjusted rates of instruction.
6. instant error detection.
7. interaction.

Video instruction alone offers (Hunter, 1981; Shelly, 1975):

1. over-all reduced (equipment) expense.
2. a medium to which people are conditioned to respond.
3. increased access to personalities (different instructors).
4. tapes that can be kept more easily updated than textbooks.
5. material which would not normally be covered either by the lecturer or textbook.
6. release from the solitary classroom and the imagination of one instructor.

Computer-directed instruction combines computerized instruction with the dynamic medium of video. Tens of thousands of logical circuits, or storage locations, can be placed onto the 1/4-square-inch chip--which programs an invisible commodity--information. The highly interactive character of computer-directed instruction promotes the development of efficient communication systems between users.

Technology, properly applied, can open up many different forms of communication beyond traditional methods. Computer directed instruction, with the video component, combines the humanizing element of video with computerized instructional sequences. This technological combination may allow the client to "see" the modes of communication. Wagman (1980) cited on page 4, found that PLATO DCS is an effective counselor for psychological dilemmas and is an effective teacher of the dilemma counseling method. Subjects in the computer-assisted solutions group appeared to view PLATO DCS as a "counselor" who would make suggestions about how to solve their dilemmas. For these students the specific and structural components were a valuable source of possible solutions. It would be of interest

to investigate whether such personality factors as dependency-autonomy (Gough, 1976), or such intellectual factors as cognitive complexity (Harvey, Hunt, & Schroeder, 1961), can distinguish students who self-generate solutions from students who assess computer-generated solutions.

Some psychologists have been concerned about the impersonal nature of solving psychological problems on a computer (Weigenbaum, 1976; 1977). The question of humanization in technology yields a paucity of literature, but remains a paramount question. Wagman (1980) found a majority (54%) of subjects in his study felt that PLATO DCS was not impersonal. In addition, a substantial percentage of the subjects actually felt more at ease (40%) and more independent (44%) on the computer than if they saw a counselor.

Finally, and perhaps the most important finding in the study was that students reacted very favorably to the teaching and counseling functions of a modern computer system. In addition to the attractiveness of PLATO DCS as a medium of presentation, the particular advantage of the dilemma-counseling method for computer presentation is that the logic of the method is the logic of the computer (Wagman, 1980). Both broader and

deeper concepts of what produces humanizing effects between students and computer systems are needed in future research.

Most of the 10 computer-based career guidance systems have utilized means by which the user communicates directly, by means of a typewriter or visual display screen terminal, with the computer's prestored text and files to receive vocational and educational information designed to assist with personal career decision making. Rayman and Bowlsbey (1977) have suggested that computerized guidance systems be classified in terms of generations--the first generation being "batch" information storage and retrieval systems; the second generation being on-line information storage and retrieval systems. Examples of second generation systems are the Computer Vocational Information System (CVIS), Oregon Career Information System (CIS), Educational and Career Exploration System (ECES) and the Guidance Information System (GIS). The third generation consists of on-line information systems that deliver significant guidance content beyond career information. System of Interactive Guidance and Information (SIGI) and DISCOVER are both examples of this third generation. It seems

examples of this third generation. It seems self-evident, that the quality of humanness in human beings, as distinguished from other biological qualities which are not uniquely human, is one which is instilled in each person by relationships with other people, the prototype relationship being, of course, the one existing between child and mother (Goshen, 1971). This quality, according to Goshen, appears to be one which requires constant and persistent nurturing through repeated experiences throughout life--experiences invariably based upon relationships with others. By the same token, this quality is diminished, distorted or arrested in its growth through various human relationships. When a person has become dehumanized, we may refer to him or her as being psychotic, by which we may mean that he or she has greatly lessened or distorted human connections with other people.

It may be conceivable that the technology of interactive computerized systems (systems utilizing video and computer) might serve as a humanistic communication tool. For example, Landers (1971) states:

> Humanization has not been described, let alone defined, to anyone's complete satisfaction. Engineers (who would help in producing the total package) have thought little about the term, and educators generally assume everyone knows what it means, without further discussion.
>
> Humanizing, as a term, seems to take on meaning only when applied to something not originally associated with it. For example, to say something like, 'A study of the humanities has a humanizing effect on humans' is to say virtually nothing. To say, 'Providing help to humans is humanizing' starts to say something. To say, 'Providing for the needs of the needy is humanizing,' says even more. In short, humanizing as a term is useful and makes sense essentially as part of some larger construct. We do have such a construct--total package education--and humanizing has an important place in it (p. 9-10).

Another approach toward humanization (Goshen, 1971) is that it is incorrect and misleading to look upon technology itself, in education or in other fields of human affairs, as being either humanizing or dehumanizing. Instead the proposition may be offered that only the people, the teacher or the institution which use (or do not use) technology have such influence. In other words, technology (in any context) is merely a tool which can be used for either constructive or destructive purposes, depending upon how the participants involved use it. Philosophically, this implies that only humans can be dehumanizing, the instruments they use never have these properties intrinsically.

Goshen (1971) futher indicates that the humanizing type of evironment is necessarily one in which human relationships appear to develop or prosper. This will require more than one person existing in the environment and that flow between them is something having emotional significance. This flow necessarily requires communication; and the degree to which the humanizing effect is developed will depend largely upon the richness of the communication.

Role of the Counselor

Warnath (1974) reports that:

> Academic people generally have tended to avoid the issue of power, feeling that it is (or should be) irrelevant in conflict resolution. Counselors have assumed that rational behavior governs human interactions and their work with students has tended to reflect this belief . . . . Stubbins and Halleck have pointed out, every counseling contract is a political act . . . either encouraging change or reaffirming the status quo. Counseling theories tend to emphasize the release of assertive impulses even though the counselor himself may be powerless (has little influence) in his own situation outside the counseling room. The counselor works on the assumption that each client can achieve personal salvation through his own efforts regardless of the social and institutional forces impinging on him. Counselors are predisposed to view the problems of their clients as their inability to adapt properly but he is poorly equipped to assess those

> factors in the client's situation which may cause legitimate maladaptive behaviors (p. 1-10).

Portable computers might be used to extend the counselor's impact and permit more individual effort on the part of the individual. Subjects could have access to systems similar to the content of PLATO DCS, not only within the dormitories as mini-counseling centers, but also within private rooms. As costs diminish this will become possible. An additional advantage of such a decentralized system is that counseling services are more likely to be obtained when needed rather than when counselor and student schedules collectively permit.

In today's populated institutions, it would seem that minisystems could be effectively used to relieve overcrowded conditions within the client population of counseling centers and substantially relieve overworked counselors. Many universities send professional counselors to dormitories in order to present workshops on a variety of problems and concerns of today's youth. Minicounseling units and tapes of lectures could be prepared and used repeatedly rather than investing the time and expense of staff workers in each unit.

Warnath (1974) further indicates that the ethnic minority of college students invariably report that they have entered college in spite of discouragement from school counselors. Women also report counselor

bias concerning preparation for careers. Furthermore on most college campuses a majority of students in the college community are not even aware that a counseling center exists (Warnath, 1974). Therefore, it would seem that more decentralized systems of counseling, and those that are specifically designed for the broad range of human problems, would provide a humanistic approach to common problems of students that are not now being met. According to Warnath, students would be generally encouraged rather than discouraged by an individual counselor who may have certain biases. And services would be available in diverse locations, such as dormitories rather than at a little-known centralized location. Counselors could then be utilized in helping students with selection of tapes that are applicable to specific problems. Decentralized systems employing microcomputers in an interactive video mode have the potential to increase the frequency of services to those students already aware of and involved in counseling services as well as to attract otherwise unserved populations.

University counseling centers and academic learning centers have developed diverse approaches designed to improve academic performance of

underachieving students (Bednar & Weinberg, 1970; Entwisle, 1960). Counseling approaches have focused on the relationship between achievement and personality, whereas study skills courses have emphasized the remediation of skill deficits and self-adjustment (Robyak and Patton, 1977).

Educators have long recognized the lack of adequate study skills, either possessed or practiced by freshman in college. Literature is replete with methods or techniques of helping the student to become better prepared for collegiate academia. Although this material may consist of expounding certain specific tasks such as the classic SQ3R technique, note-taking, or so-called speed reading, Pauk (1973) contends that many college reading programs spend precious time on questionable techniques of teaching. Lasnik (1972) points out that speed problems are in actuality a result of other problems, such as lack of concentration, inefficient study habits, and lack of background in the material being studied.

Sherman (1971) recognizes the problem of ascertaining the study skills needs of students which Ahrendt (1975) thinks is made even more difficult because the college student has learned to mask

effectively the symptoms and deficiencies he or she has in learning. The most frequently employed instruments for investigating and measuring these study skill needs are checklists, questionnaires, compositions, inventories, and interviews. By these methods, much subjective information about students' study skills and work habits have been collected. While these checklists and questionnaires are often subject to severe limitations, they are in extensive use by most investigators.

Plotsky (1974) maintained that each adult learner has his own difficulties to overcome and that one of the most haunting problems for many adults is the fear that they do not have the ability to study, to concentrate, or to remember. Many of these problems stem from a poor self-concept, perhaps from a previously poor or unsuccessful learning experience. She concludes that the self-concept of the student returning to education is of importance in influencing ability to learn and interest in learning. The literature likewise suggests that the self-concept can be changed but a positive image of self-as-a-student that the adult brings to the educational experience is

necessary for the adult to benefit from a new educational enterprise.

Farmer (1975) states that "there is strong support that the students can change study habits via study habits courses, programs, or counseling. There is currently an increasing need for counseling to become an integral part of the instructional process. Counselors can provide proper assistance to those students with needed skills in order that the students can deal more effectively with their studies. Integrating instructional modes with counseling techniques can provide meaningful improvement in performance or study habits behavior." Technology, properly applied, can permit development of many different forms of assistance for individual and group needs.

CHAPTER III

METHODOLOGY

This chapter describes the subjects used in the study, the procedures used, and the statistical procedures established before the study was conducted. This study represents an initial attempt to examine the performance of subjects who had received instruction by traditional approaches and by means of computer-directed instruction. Thus, it was considered important to carefully narrow the focus of the study in order to compare subjects on the dependent variable, while at the same time attempting to eliminate problems in the experimental design that might threaten external and internal validity of the results. Therefore, a straightforward, experimental design was used employing two groups, randomized subjects, and a post test on the dependent variable. However, a pre-treatment design was used in order to provide better control in the experimental design.

Computer-directed instruction (CDI) was described in Chapter II. It will be reiterated here for clarity. CDI combines computerized instruction with the dynamic medium of video by means of an interactive control

medium of video by means of an interactive control board that permits the curriculum developer to integrate video and computer instruction. The control board may address any video frame directly, drive the video cassette recorder to any video frame, turn the recorder off and on, and return control of the program to the computer for directions and interaction of the respondent. The highly interactive character of CDI permits the development of efficient communication systems between users. CDI combines the humanizing element of video instruction with computer instructional sequences. Through the innovation of state-of-the-art technology, it is now possible to deliver instructional and guidance-related content to any subject at any remote location.

Subjects

The subjects for this study were selected from a larger group of two sections of students enrolled in Study Skills courses of the College of Education, University of Arkansas. The original classes included thirty-two students, sixteen in each class. A total of thirty-two white subjects, sixteen males and sixteen females, were randomly assigned to treatment and

comparison groups after a pre-treatment phase that will be described below. All students were enrolled in the Study Skills classes because of a need to develop more efficient learning techniques to be used in college courses of various curricula. Some voluntarily enrolled because of poor grades while others were advised to enroll by counselors.

Procedure

The procedure involved two phases. Phase one was a pre-treatment phase in which it was necessary to determine that the subjects who would be selected for the treatment and comparison groups would not be different in important characteristics that might affect the dependent variable. Every attempt was made to determine that subjects in the experimental and comparison groups would differ only in exposure to the independent variable during treatment. Phase two was the actual treatment phase of the study. Both phases are described in detail in the sections that follow.

Pre-treatment Phase

The pre-treatment phase consisted of pre-treatment experiences and evaluation of groups selected for the

original pool of potential subjects. The main purpose of this phase was to assure that the experimental design would be appropriate for testing the specific hypothesis of the study. The design was selected to meet the needs of the experimental problem posed in the first chapter.

Two morning sections of the Study Skills classes were selected; one class met at 8:30 a.m. and the other at 9:30 a.m. Each class met three times each week, on Monday, Wednesday, and Friday. Selection of classes at the same time of the day was considered important because of the possible complicating factors inherent in the personalities of subjects who select morning classes and those who choose them in the afternoon. This might also account for such factors as variable fatigue, hunger, and so forth that would be associated with different class schedules.

Each class was taught by different instructors in the Reading Skills Laboratory located in Peabody Hall on the campus. The curriculum and lecture sequence of each class was similar. Thus, each class was to cover the same content over the course of the semester under the direction of an instructor who would deliver course content primarily through a lecture format, a

predominant instructional pattern used in American institutions of higher education.

The developmental process of the content and video instructional tapes is addressed in Appendix G.

Rather than using a simple two-group, static design by simply exposing one intact class of subjects to treatment and using the other for control, it was determined that a two-group, randomization posttest design would be superior. In order to do this, it was necessary to assure that the groups were equivalent prior to the experimental treatment on as many relevant variables as possible. To assure that the groups were equal with respect to all factors that might have an influence on the dependent variable, a series of activities was planned which would provide better control in the actual treatment phase.

Each intact class, comprised of sixteen students each, was submitted to two sessions of instruction based on CDI. Content of the Study Skills class, that would be covered in a lecture format by their instructors equivalent to a one-hour lecture, was developed for presentation on the microprocessor and video cassette recorder by the investigator. One unit

of instruction pertained to memory and the other to concentration.

Each unit permitted the subjects to gain experience with the technological hardware and the mode of presentation. It took each subject approximately thirty minutes to complete both units over a period of one class period. All subjects had completed both units of CDI by the end of one week. Each subject was given an examination at the end of each unit of instruction presented during pre-treatment. The examinations for each unit consisted of seven items and followed the same format.

At the conclusion of this stage, each subject in both classes was subjected to pre-treatment evaluation in the areas of attitude toward computer-directed instructional experience, to comparisons on American College Test scores (ACT), and to comparisons on high school grade point averages (GPA). Measurement of attitudes was accomplished through the use of a seven-item instrument adapted for use in this investigation. A Likert-type scale was employed in five of the seven items. Two of the items were open-ended, allowing student reaction and input. The instrument was adapted by the investigator, with the assistance of Dr. Edward Furst of the faculty of the

assistance of Dr. Edward Furst of the faculty of the College of Education, University of Arkansas, from an existing instrument developed independently of Dr. Furst.

The five scaled areas of attitude assessment were: attitude toward computer, instructional approach preference, attitude toward classroom instruction, preference for frequency of computer usage, and preference for frequency of interactive instruction in specific subject area. The attitude instrument was administered to each student individually immediately following experience with one of the CDI units included in the pre-treatment. A complete copy of the instrument may be found in Appendix A.

The purpose of the pre-treatment phase was to assure that subjects who would be selected for the final treatment phase would not be different on such variables as: awareness of computer instruction, exposure to computer-directed instruction, interaction with hardware, time of exposure, competency in operating equipment, attitudes toward technology, ACT scores, and high school grade point average.

Treatment

After the pre-treatment phase, subjects were treated as a single pool because no statistical differences were found on any of the measures described above. Statistical analyses are reported in Chapter IV. For the treatment phase, sixteen (16) subjects were randomly assigned to the treatment group and sixteen (16) were assigned to the comparison group. Selection was made with a table of random numbers. The treatment phase was concerned with measuring differences between the groups consistent with the hypothesis stated in Chapter I which is reiterated as follows:

Ho: There is no difference between the group receiving traditional instruction and the group receiving computer-directed instruction on a measure of knowledge of content.

The content for the treatment phase for the comparison group, consisting of normal course subject matter about test-taking, was presented by one instructor of study skills during a routine hour-long lecture. To assure that the dependent variable would not be affected by differences in personal style of instruction, the instructor volunteered to teach the

8:30 a.m. and the 9:30 a.m. sections for presentation of this content. This was considered to be a valid approach in view of the fact that the students in both sections were familiar with both instructors and had previous experience with them in a classroom environment. This was another effort to control for extraneous variables that might affect the outcome. The instructor had the regular instructional outline and materials associated with the routine course requirements for all units including test-taking. These materials included the objectives and content outline. The investigator and the instructor reached concensus about the nature of the content that would be presented to both groups through different means; that is, the content was identical, only the means of delivery was varied. Furthermore, it was agreed by the investigator and the instructor that the test which would be used to measure knowledge acquisition on the test-taking unit would be identical for both the treatment and comparison groups. The content validity of the test was supported by an identical curriculum base in both instructional approaches; the instructor in the lecture class agreed that the test was a fair assessment of the content she had presented. A copy of

the instrument used to measure knowledge of content on the test-taking lesson is included in Appendix B. Thus, it could be reasonably expected that any difference that would exist between the experimental and comparison groups at the end of the study would not be caused by differences in the facts, information, or assessment procedures. The content and assessment of knowledge were identical under experimental and comparison conditions; the means of presentation varied.

Statistical Analysis

Statistical procedures were employed to test the following hypothesis as stated previously:

There is no difference between the group receiving traditional instruction and the group receiving computer-directed instruction on a measure of knowledge of content. The statistical test for this hypothesis was the *t*-test for independent samples with significance set at the .05 level of probability.

There were seven statistical analyses conducted during the pre-treatment phase on attitudes, ACT scores, and high school GPA. These were also subjected to the *t*-test for independent samples with significance set at the .05 level of probability.

CHAPTER IV

ANALYSIS OF THE DATA

This study was concerned with the comparison of comparable groups of college students, enrolled in Study Skills classes, on measures of knowledge acquisition in a specific unit of instruction. The groups were subjected to different instructional approaches: the experimental group received instruction on a computer-controlled video unit; the comparison group received instruction in a regular lecture class presentation.

The samples for this study consisted of subjects who were selected from among students enrolled in sections of a study skills class of the College of Education, University of Arkansas. A pre-treatment evaluation was conducted to assure that the final groups would not differ significantly in any extraneous variables that might influence the interpretation of the outcome of the study. After final selection of subjects, the treatment phase was implemented. Subjects, who did not differ in any significant way on any important variable, including exposure to the

computer medium, were subjected to the same content by different instructional means (CDI vs. lecture).

Results of Pre-treatment Evaluation

The pre-treatment data for the two original intact classes were submitted t analysis with a t-test for independent samples. No differences beyond chance were found for the groups on five measures of attitude, on the ACT scores, or on GPA. The t-values for each of the pre-treatment evaluations are reported in Tables 1 and 2. The groups were also similar in educational level, and other characteristics; therefore, the two groups could be considered to be similar, allowing further analysis and experimentation.

Results of Treatment

The computed t-value for the comparison was 3.13,which was significant at the .01 level (Table 3).

Furthermore, a measure of time-on-task was kept by simply recording the amount of time it took each subject to complete the computerized lesson. The average mean time was 31.8 minutes, with a standard deviation of 4.16 which is considerably less than the hour-long period of fixed instruction required of subjects in the traditional or comparison group.

Table 1

t-Test of Means for ACT

	1st Sample		2nd Sample
N	16		16
Mean	16.13		19.12
SD	5.00		4.26
t value =		1.83(NS)*	

t-Test of Means for HS GPA

	1st Sample		2nd Sample
N	16		16
Mean	13.26		2.89
SD	.61		.68
t value =		1.64(NS)	

*NS = Non-significant

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Table 2

t-Test of Means of Attitude

Question	1st Sample		2nd Sample
Question 1			
N	16		16
Mean	4.31		4.40
SD	.60		.72
t value =		.27(NS)*	
Question 2			
N	16		16
Mean	4.5		4.31
SD	.52		.70
t value =		.86(NS)	
Question 3			
N	16		16
Mean	2.75		3.13
SD	1		1.09
t value =		1.02(NS)	
Question 4			
N	16		16
Mean	3.19		3.19
SD	.65		.75
t value =		T = 0(NS)	
Question 5			
N	16		16
Mean	3.31		3.4
SD	.70		.81
t value =		.23(NS)	

*NS = Non=significant

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Table 3

t-Test of Means for Achievement Test

	1st Sample		2nd Sample
N	16		16
Mean	6.44		5.38
SD	.73		1.15
t value =		3.13	

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Research involving the efficacy of computerized counseling and teaching has been conducted on a limited basis over the last decade because computers have been very expensive and unavailable, and there has not been a need to include computers as instructional devices. The needs of educators in the emerging computerized environment may awaken a tide of investigation as the promise of the new technology is recognized. Technology may be welcome as higher education faces major economic problems in the next decade. Unfortunately, much of the research about computer usage in education has involved older, complex systems and limited software (CAI). No research has been directed at the use of computer controlled video in education.

There is sufficient reason to believe that computer-directed instruction holds promise as an alternative to traditional classroom instruction and other types of student learning. Applications to other content areas such as business and industrial training

seminars hold promise for the future. Regardless of the nature of the content, computer-directed instruction may have applications in virtually all content areas. This study was an attempt to investigate the efficacy of computer controlled video training, a preliminary study in the field of education. One of the most important ramifications of this study relates to the role of the counselor. If the counselor is to fulfill all of the traditional roles and even as Riccio (1967) suggests become a "change agent," it seems reasonable to assume that time-efficiency and effectiveness are very important. Technology, therefore, may be considered as an appropriate approach to achieving the goals of counseling.

This study addressed three research questions: 1) What will be the overall attitude of students to CDI (Computer Directed Instruction) as compared to traditional teaching approaches of similar sequences? 2) Will the two groups differ significantly in knowledge of test-taking after the treatment? 3) Will the two groups differ significantly in the amount of time spent in CDI (Computer Directed Instruction) as compared to traditional instruction on a time basis?

Hypothesis Tested

The following hypothesis was tested in the study: There is no difference between the group receiving traditional instruction and the group receiving computer-directed instruction on measures of content knowledge.

The t-test for independent samples was used with significance set at the .05 level of probability. Results indicated that there was a significant difference between the means of the two groups and, therefore, the null hypothesis was rejected.

Research question number one addresses the overall attitude of students to (CDI) Computer Directed Instruction as compared to traditional teaching methods. The pre-treatment phase assessed the attitudes of students enrolled in two morning sections of the Study Skills classes of the College of Education. Each class met three times each week, on Monday, Wednesday and Friday. Selection of morning classes was considered important because of possible inherent factors associated in the personalities of subjects who select morning classes.

Each class was taught by different instructors in the Reading Skills Laboratory located in Peabody Hall

on the campus of the University of Arkansas. The curriculum and lecture sequence of each class was similar. Thus, each class was subjected to similar content lessons; only the method of delivery varied. One class was subjected to traditional teaching methods and the following week similar content was delivered through computer-directed instruction (CDI). The other class followed a similar pattern. All students were enrolled in the Study Skills classes because of a need to develop more efficient techniques to be used in college courses of various curricula; some voluntarily enrolled because of poor grades; others were advised by their counselors to enroll.

Following the pre-treatment phase the students were immediately administered an attitude assessment that was adapted by the investigator, with the assistance of Dr. Edward Furst of the faculty of the College of Education, University of Arkansas, from an existing instrument developed independently of Dr. Furst.

The five scaled areas of attitude assessment were: attitude toward computer, instructional approach preference, attitude toward classroom instruction, preference for frequency of computer usage, and

preference for frequency of interactive instruction in specific subject area. A complete copy of the instrument may be found in Appendix A. No differences beyond chance were found for the groups on measures of attitude toward computer-directed instruction (CDI) and traditional teaching approaches.

Research question number two addressed the question of finding significant differences in knowledge of test-taking after the treatment phase. To assess this, subjects were regarded as a common pool because no statistical differences were found on such variables as: awareness of computer instruction, interaction with hardware, time of exposure, competency in operating equipment, attitudes toward technology, ACT scores and high school grade point average. For this phase, sixteen (16) subjects were randomly assigned to the comparison group. A table of random numbers was utilized in the selection. This phase was concerned with measuring differences between the groups on measures of knowledge of test-taking. The content for the treatment phase for the comparison group consisted of normal course subject matter and objectives about test-taking, presented by one instructor of study skills during a routine hour-long

lecture. The investigator had similar subject matter and objectives. Thus, the content was identical for both lectures; only the means of delivery varied. Following the administration of the treatment, both groups were subjected to a measure of knowledge acquisition on the lesson test-taking. A copy of the instrument used to measure knowledge of content on the test-taking is included in Appendix B. The t-value for the comparison was significant at the .01 level (Table 3). Thus, the two groups differed significantly in knowledge of test-taking after the treatment.

Finally, research question number three addressed the question of differences in time spent in instruction between the computer-directed instructional group and the traditional group. Students were timed during the actual treatment phase. A measure of time was held constant in the traditional teaching lesson. Students engaged in computer-directed instruction (CDI) were also timed during the interaction phase. The computerized phase took approximately one-half the time required for the traditional lesson. Thus, the two groups differed in the amount of time in instruction.

The t-test for independent samples was used with significance set at the .05 level. Results indicated

that there was a significant difference between the means of the two groups.

The major findings of the study indicate that similar content may be presented in lecture-based and computerized formats, with computer-video segments presenting information in a much shorter period of time; but, students receiving computer-directed training were able to pass a test with a significantly higher score than the comparison group.

Conclusions

Based on the findings of this study, it can be concluded that:

1) it is possible to adequately present course content through interactive technology.

2) competency can be met through use of a computer-controlled video lesson in a much shorter period of time than a traditional lecture-based lesson.

3) computer-video instruction can supplant an instructor for at least one lesson of instruction.

4) students do not have preferences regarding the implementation of instruction with the traditional teaching method when compared with the computer-directed instruction method (CDI).

Limitations

Any conclusions of this study must be treated with caution. There were several limitations because of the type of students selected, the constrained amount of information actually used in the experiment, and the period of time encompassed in the study. Another limitation includes that no attempt was made to measure the application of the knowledge acquired. True impact or effect in terms of long-time student performance in studying was not investigated. The intent was not to measure knowledge skill but application.

It is certainly true that most college students are not entertained in their classes; many complain that their courses are boring. In fact, lectures and the older generation of video training are frequently described as the "talking head" instructional approach. It should not be necessary for computerized instruction to be any more entertaining; but, it should be more effective and cost efficient, especially if it is to be used in the future to solve problems in higher education.

Obviously, there are many variables that might be examined in future studies such as the effects of different video sets, age and sex of the video

3. Additional investigations should be done with college students having different characteristics.
4. Further research could be applied to other content areas such as industry and business.
5. Further research is also needed in applications of knowledge of memory, concentration, and preparing for exams.

presentor, and reactions to various types of content. As computer technology advances, instructional authoring languages will become available which offer a broader range of graphic and visual effects, including text in color, animation, and variations of letter type. With the advent of these innovations, the need for research will continue in order to assess their impact on the learner and the manner in which they interact with the video segments. At least this study may have contributed to the emerging change in education.

Recommendations

This study has led to the following recommendations which were developed to apply to populations from which the sample in this study would be regarded as representative and anticipation that further research will be conducted.

1. Longitudinal investigations utilizing larger samples should be conducted.
2. Further research is needed in the utilization of these procedures to counseling.

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Appendix A

Attitude Examination

Name _____

Date _____

Below is a list of questions that we would like you to consider. Try to decide which response best describes your feelings for each statement. Use checks ( ) above the appropriate response to record your judgments. Please be honest in your judgments. They will not affect your standing in this course in any way.

1. How well do you like using the interactive video computer?

Not at all	Not much	So-so	Pretty Well	Very much

2. How well do you like using the computer as compared to regular classrom instruction?

Not at all	Not much	So-so	Pretty Well	Very much

3. How well do you like regular classroom instruction?

Much poorer	A little poorer	About the same	A little better	Much better

4. How often do you think the interactive video computer should be utilized within the classroom for review or practice purposes, in addition to regular classroom instruction?

Not at all	Once every two or three weeks	Once a week	Three times a week	Every day

5. How often do you think the interactive video computer should be used in this course for instruction?

Not at all	Once every two or three weeks	Once a week	Three times a week	Every day

6. What changes would you suggest in the computerized program?

7. Overall comment or experience:

Appendix B

Achievement Examinations

UNIT: Concentration

Choose the best answer that coincides with your unit instruction.

1) The first thing you should do when taking a test is to

   a) count the number of questions
   b) read the directions carefully
   c) skim over the entire test

2) Which of the following should not be considered in test directions?

   a) the number of questions
   b) the time limit
   c) the organization of the questions

3) Which word best describes a question that requires you to support or illustrate your answer?

   a) identification
   b) demonstration
   c) comparison

4) In answering multiple choice questions, you should

   a) eliminate obvious wrong answers first
   b) stop at the first possible answer
   c) consider the organization of the questions

5) In answering true-false questions,

   a) statements with words such as all, always, and never are usually true
   b) one must concentrate carefully
   c) support your answers

6) The first thing to do when taking an essay test is to

   a) organize your thoughts
   b) make an outline
   c) meditate

7) Negative behavior can cause

   a) relaxed states
   b) text anxiety
   c) fatigue

Unit Exam: Concentration

Choose the best answer that coincides with the unit instruction.

1. Concentration is the ability to fix your _____ on something.

   (a) understanding (b) attention (c) study habits (d) self

2. The reason many students have a difficult time concentrating on studying is a lack of _____.

   (a) concentration (b) time (c) intelligence (d) interest

3. Subjects should be selected that _____ you.

   (a) assist (b) interest (c) challenge (d) relax

4. Loud music is an example of an _____ distraction.

   (a) interesting (b) challenging (c) auditory (d) stimulating

5. Hunger and _____ are also barriers to concentration.

   (a) television listening (b) radio listening (c) anxiety (d) fatigue

6. The first thing you should do to improve your concentration is to develop a _____ for the subjects.

   (a) concern (b) interest (c) curiosity (d) consciousness

7. Having your tasks _____ and knowing what you are to do next aids in concentration.

   (a) organized (b) numbered (c) arranged (d) selected

Unit Exam: Memory

Choose the best answer that coincides with the unit instruction.

1. Memory is the ability to learn, store, and _____ information.

   (a) understand (b) recall (c) compute (d) assimilate

2. Information that is stored for years is called
   (a) cerebral (b) long-term (c) short-term
   (d) medium term

3. The two most common mistakes, regarding memory, are trying to remember too much and _____.

   (a) fatigue (b) eating (c) distractions (d) cramming

4. Memory is easier if you _____ what you are trying to learn.

   (a) recall (b) store (c) understand (d) cram

5. If you do not _____ you will forget what you learn.

   (a) recall (b) review (c) associate (d) cram

6. Studying similar subjects close together can cause _____.

   (a) distractions (b) interference (c) improvement
   (d) infusion

7. An _____ is when you make a word using the first letter of words you want to remember.

   (a) synonym (b) prefix (c) suffix (d) acronym

Appendix C

Computer Instruction Manuscript

(Non-traditional Approach)

UNIT: Concentration

Objectives of the unit:

1. Define attention.
2. List three barriers to concentration.
3. Describe the role of interest in concentration.

Everyone has a difficult time concentrating from time to time. If this should happen to you occasionally, do not be concerned. If, however, it is a chronic problem, you should attempt to do something about it. The first step is to understand what concentration is--the ability to fix your attention on something. Keeping your attention on something is not too difficult. For example, when you watch television or read a book, you probably have little difficulty fixing your attention. Why then do you often have difficulty concentrating on studying? The reason is probably that you are simply not interested.

Concentration is the ability to fix your _____ on something.

A:

M: attention

T: The reason many students have a difficult time concentrating on studying is a lack of _____.

A:

M: interest

T: There are several things that act as barriers to concentration. The first is a lack of interest. If you are not interested in something, it is much more difficult for you to concentrate than if you were interested. When possible, you should select subjects that do interest you. This will assist you in being able to concentrate.

T. When possible, you should select subjects that _____ you.

A:

M: interest

T: A second barrier to concentration is a distraction. Distractions take many forms, including visual distractions, such as cars going by the window or people doing something in the room. Auditory distractions, including people talking, music, loud noises outside, and the television, are also barriers.

T: Loud music would be an example of an _____ distraction.

A:

M:

T: Hunger and fatigue are also barriers to concentration. If you are hungry, it is very difficult to concentrate on studying. More than likely you will be thinking about your hunger, or something to eat. The same holds true if you are fatigued. When you are tired, you may have a difficult time staying awake, or simply being able to keep you mind on your studies.

T: Hunger and _____ are also barriers to concentration.

A:

M: fatigue

T: If you have a difficult time concentrating, there are some things you can do to increase your ability. First, you should attempt to develop an interest in your subject. Unfortunately, you often have to take classes that are of little interest to you. In these cases, your ability to concentrate in studying the subject will be hampered.

T: The first thing you should do to improve your concentration is to develop an _____ in the subject.

A:

M: interest

T: If you approach studying in an unorganized manner, your ability to concentrate is hindered. Having your study tasks organized and knowing what you are to do next aids in concentration. The last suggestion in helping you learn to concentrate is

to practice. Studying takes practice. You may have been able to make good grades without a great deal of studying. If this is the case, your ability to concentrate will probably be less than if you have had to concentrate in order to make good grades.

T: Having your tasks _____ and knowing what you are to do next aids in concentration.

A:

M: organized

UNIT: Memory

T: Objectives of the Unit:

1. Define memory.
2. List three sources of clues to important facts that should be remembered.
3. Describe the three kinds of memory.
4. Define cramming.
5. Describe two guidelines for understanding.
6. Describe the role of reviewing in memory.
7. List three tips for remembering what you review.
8. Describe two types of association.
9. List two advantages to using review cards.
10. Describe the use of acronyms in memory.

T: One of the most important skills you need to be a good student is memory. Memory is the ability to learn, store, and recall information. Without the ability to remember, you will have difficulties in your studies.

T: Memory is the ability to learn, store, and _____ information.

A:

M: recall

T: One thing that helps your memory is motivation. If you know why you should remember something, and want to remember it, you have a good start in remembering it. In addition to having a desire to remember something, you need to know what you should remember. As a student, you are bombarded with information. If you tried to remember it all, you would overload your memory capacity. The following sources provide you with clues to important facts that should be remembered:

1. class syllabus
2. lectures

3. table of contents in text
4. headings in chapters
5. author's questions

T: You need to know what is _____ enough to remember.

A:

M: important

T: There are three kinds of memory--short-term, medium-term, and long-term. Short-term memory is when information is stored for only a few minutes. Medium-term memory stores facts for several months, and long-term memory keeps information for years. Regardless of the type of memory, if information is not reviewed, it will be forgotten.

T: The three types of memory are _____.

A:

M: short-term, medium-term, and long-term

T: If you cram information into short-term memory that should be stored in medium or long-term memory, it is called cramming. Cramming, along with trying to remember too much, are the two most common mistakes made by students.

T: The two most common mistakes, regarding memory, are trying to remember too much and _____.

A:

M: cramming

T: If you understand what you are trying to learn, memory is made easier. Guidelines for understanding include:

1. proceed paragraph by paragraph
2. use reference books
3. ask for help
4. start with easier books

T: Try to learn the main ideas first, then learn the specifics.

T: Memory is easier if you _____ what you are trying to learn.

A:

M: understand

T: If you are to remember what you learn, you must review. The more often you learn something, the more you remember. This means you should have a systematic procedure to review your information. Ideally, you should review:

1. at the end of the study session
2. at the beginning of the next session
3. after one week
4. after one month
5. monthly

T: If you do not _____, you will forget what you learn.

A:

M: review

T: Reviewing simply to say you have reviewed may not help you remember. You should overlearn when you review (keep reviewing after you learn the material). Also, avoid interference when you review. Do not study similar topics one after the other. Your memory may get confused. Using a tape recorder in review may be helpful. This will provide you with a change of pace in your reviewing.

T: Studying similar subjects close together can cause _____.

A:

M: interference

T: One method used by many students to aid in memory is association. Association is when you connect feelings, facts, or ideas. Content association is when the connections are made based on content. When you link facts or ideas with mental pictures in sequence, you are using chaining association. Rhyming association is when you tie facts

together using rhymes and mental pictures. In making associations using mental pictures, you should always use vivid pictures. This aids in your recall.

T: The three types of association are _____.

A:

M: content, chaining, and rhyming

T: Regardless of the amount and duration of your reviews, occasionally you may feel the need to use memory tricks. These tricks, while not substituting for good study, are often helpful in school. One memory game is using acronyms--forming a word from the first letters of several words you want to remember. You also may use acronym sentences. This is when you use the first letters of words you want to learn as the first letters in words of your made-up sentence.

T: An _____ is when you make a word using the first letter of words you want to remember.

A:

M: acronym

T: Another method of strengthening your memory is to use review cards. Review cards let you:

1. present one item at a time
2. recall before you see the answer
3. review frequently as they are easy to carry around

T: A tip in memorizing prose and poetry is to always go back to the beginning each time you learn a new line. This forces overlearning and ties your new lines into the proper sequence.

T: A review card allows you to _____ information before you see the answer.

A:

M: recall, remember

T: In memorizing poetry, you should go to the _____ after learning a new line.

A:

M: beginning

UNIT: Test-Taking

Computer Lesson

Objectives of this unit:

1. Describe the importance of reading test directions.
2. List what to look for in test directions.
3. List tips to use in test-taking.
4. Describe test anxiety and ways to cope with it.

Let's look at these four important things in test directions:

1. Time limit
2. Number of questions
3. Value of each item
4. Recording answers

Time Limit: This is important because you may need to pace yourself when answering. You cannot spend all of your time on one question. Keep an eye on the clock and keep yourself moving through the items, even if you must skip some items at first reading.

Number of Items on the Test: Skim the test and see how many items are on the test. Look to see if the test is divided into sections or parts. Then check the number of items in each part or section so that you do not get confused and accidentally skip items.

Value of Each Question: Check to see how many points each item is worth. If there are some items which are worth more points than others, you should spend more of your time on the most valuable items. If you have to skip items, skip the ones worth fewer points.

How to Record Your Answers: Be sure that you know how your answers should be written. Should they be T and F or do you need the whole words True and False? Do you write on the test or on an answer sheet? Do you write the letter of the multiple-choice item or should you circle it?

Let's see how you are doing. Type in True or False after reading the following statement.

The first thing you should do when taking a test is to read the directions carefully.

Try out what you now know about reading instructions. Read the following instructions carefully because you will be expected to follow them on the next test item.

Instructions: Select the number or numbers of the best answer or answers. Type in the number or numbers. If you select more than one number, type them in with one space between each number but WITHOUT a comma.

Which of the following should be considered in test directions?

1. The number of questions
2. the time limit
3. the value of the questions
4. how to record answers

Let's review those types again.

1. Identification: identify something
2. Demonstration: support answers
3. Comparison: tell how something is similar or different
4. Evaluation: provide opinions and facts

Here are the types again:

Demonstration
Identification
Evaluation
Comparison

Type in the answer of the word which best describes a question that requires you to support or illustrate your answer.

Multiple choice questions can be very tricky. Watch out! Select the only wrong answer by typing its number.

In answering multiple-choice questions, . . .

1. think before looking

2. read all possible answers

3. give up

See! Now you know what we mean by the word "tricky." Try it again and watch out.

These two types of questions--matching and sentence completion--require you to work harder than multiple-choice questions. Try it and see.

Sometimes the _____ of blanks in a sentence completion test will give you a hint.

(Type in the answer)

Answer T for True and F for False.

The first thing to do when answering an essay test is to outline all you know about each question.

Do you want to see the list of things to do to reduce anxiety?

1. Realize the negative behavior caused by the anxiety.

2. Recognize the positive behavior that will reduce the anxiety.

3. Relax and calmly redirect your attention to the test and what you know about it.

Appendix D

Teacher Instruction Manuscript

(Traditional Approach)

UNIT: Concentration

Objectives of the unit:

1. Define attention.
2. List three barriers to concentration.
3. Describe the role of interest in concentration.

Everyone has a difficult time concentrating from time to time. If this should happen to you occasionally, do not be concerned. If, however, it is a chronic problem, you should attempt to do something about it. The first step is to understand what concentration is--the ability to fix your attention on something. Keeping your attention on something is not too difficult. For example, when you watch television or read a book, you probably have little difficulty fixing your attention. Why then do you often have difficulty concentrating on studying? The reason is probably that you are simply not interested.

Concentration is the ability to fix your _____ on something.

A:

M: attention

T: The reason many students have a difficult time concentrating on studying is a lack of _____.

A:

M: interest

T: There are several things that act as barriers to concentration. The first is a lack of interest. If you are not interested in something, it is much more difficult for you to concentrate than if you were interested. When possible, you should select subjects that do interest you. This will assist you in being able to concentrate.

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T: When possible, you should select subjects that _____ you.

A:

M: interest

T: A second barrier to concentration is a distraction. Distractions take many forms, including visual distractions, such as cars going by the window or people doing something in the room. Auditory distractions, including people talking, music, loud noises outside, and the television, are also barriers.

T: Loud music would be an example of an _____ distraction.

A:

M: auditory

T: Hunger and fatigue are also barriers to concentration. If you are hungry, it is very difficult to concentrate on studying. More than likely, you will be thinking about your hunger, or something to eat. The same holds true if you are fatigued. When you are tired, you may have a difficult time staying awake, or simply being able to keep your mind on your studies.

T: Hunger and _____ are also barriers to concentration.

A:

M: fatigue

T: If you have a difficult time concentrating, there are some things you can do to increase your ability. First, you should attempt to develop an interest in your subject. Unfortunately, you often have to take classes that are of little interest to you. In these cases, your ability to concentrate in studying the subject will be hampered.

T: The first thing you should do to improve your concentration is to develop an _____ in the subject.

A:

M: interest

T: If you approach studying in an unorganized manner, your ability to concentrate is hindered. Having your study tasks organized and knowing what you are to do next aids in concentration. The last suggestion in helping you learn to concentrate is to practice. Studying takes practice. You may have been able to make good grades without a great deal of studying. If this is the case, your ability to concentrate will probably be less than if you have had to concentrate in order to make good grades.

T: Having your tasks _____ and knowing what you are to do next aids in concentration.

A:

M: organized

UNIT: Memory

T: Objectives of the Unit:

1. Define memory.
2. List three sources of clues to important facts that should be remembered.
3. Describe the three kinds of memory.
4. Define cramming.
5. Describe two guidelines for understanding.
6. Describe the role of reviewing in memory.
7. List three tips for remembering what you review.
8. Describe two types of association.
9. List two advantages to using review cards.
10. Describe the use of acronyms in memory.

T: One of the most important skills you need to be a good student is memory. Memory is the ability to learn, store, and recall information. Without the ability to remember, you will have difficulties in your studies.

T: Memory is the ability to learn, store, and _____ information.

A:

M: recall

T: One thing that helps your memory is motivation. If you know why you should remember something, and want to remember it, you have a good start in remembering it. In addition to having a desire to remember something, you need to know what you should remember. As a student, you are bombarded with information. If you tried to remember it all, you would overload your memory capacity. The following sources provide you with clues to important facts that should be remembered:

1. class syllabus
2. lectures
3. table of contents in text
4. headings in chapters
5. author's questions

T: You need to know what is _____ enough to remember.

A:

M: important

T: There are three kinds of memory--short-term, medium-term, and long-term. Short-term memory is when information is stored for only a few minutes. Medium-term memory stores facts for several months, and long-term memory keeps information for years. Regardless of the type of memory, if information is not reviewed, it will be forgotten.

T: The three types of memory are _____.

A:

M: short-term, medium-term, and long-term

T: If you cram information into short-term memory that should be stored in medium or long-term memory, it is called cramming. Cramming, along with trying to remember too much, are the two most common mistakes made by students.

T: The two most common mistakes, regarding memory, are trying to remember too much and _____.

A:

M: cramming

T: If you understand what you are trying to learn, memory is made easier. Guidelines for understanding include:

1. proceed paragraph by paragraph
2. use reference books
3. ask for help
4. start with easier books

T: Try to learn the main ideas first, then learn the specifics.

T: Memory is easier if you _____ what you are trying to learn.

A:

M: understand

T: If you are to remember what you learn, you must review. The more often you learn something, the more you remember. This means you should have a systematic procedure to review your information. Ideally, you should review:

1. at the end of the study session
2. at the beginning of the next session
3. after one week
4. after one month
5. monthly

T: If you do not _____, you will forget what you learn.

A:

M: review

T: Reviewing simply to say you have reviewed may not help you remember. You should overlearn when you review (keep reviewing after you learn the material). Also, avoid interference when you review. Do not study similar topics one after the other. Your memory may get confused. Using a tape recorder in review may be helpful. This will provide you with a change of pace in your reviewing.

T: Studying similar subjects close together can cause _____.

A:

M: interference

T: One method used by many students to aid in memory is association. Associatin is when you connect feelings, facts, or ideas. Content association is when the connections are made based on content. When you link facts or ideas with mental pictures in sequence, you are using chaining association. Rhyming association is when you tie facts

together using rhymes and mental pictures. In making associations using mental pictures, you should always use vivid pictures. This aids in your recall.

T: The three types of association are _____.

A:

M: content, chaining, and rhyming

T: Regardless of the amount and duration of your reviews, occasionally you may feel the need to use memory tricks. These tricks, while not substituting for good study, are often helpful in school. One memory game is using acronyms--forming a word from the first letters of several words you want to remember. You also may use acronym sentences. This is when you use the first letters of words you want to learn as the first letters in words of your made-up sentence.

T: An _____ is when you make a word using the first letter of words you want to remember.

A:

M: acronym

T: Another method of strengthening your memory is to use review cards. Review cards let you:

1. present one item at a time
2. recall before you see the answer
3. review frequently as they are easy to carry around

T: A tip in memorizing prose and poetry is to always go back to the beginning each time you learn a new line. This forces overlearning and ties your new lines into the proper sequence.

T: A review card allows you to _____ information before you see the answer.

A:

M: recall, remember

T: In memorizing poetry, you should go to the _____ after learning a new line.

A:

M: beginning

UNIT: Test-taking

Instructor's Lesson

The objectives for the study skills unit on test-taking include the following list:

1. Describe the importance of reading test directions.
2. List what to look for in test directions.
3. List tips to use in test-taking.
4. Describe test anxiety and ways to cope with it.

Briefly, here are the big ideas.

A. Reading Directions

Take note of time limit, number of questions, value of each, and how to record your answers.

B. Type of Questions

identification: ask to identify something
demonstration: support your answers
comparison: how similar and different
evaluation: provide opinions and facts

C. Tips for Multiple Choice Questions

think first
do not stop at the first possible answer
eliminate obvious wrong answers first

D. Matching Questions

notice number of blanks
pay attention
notice the articles before the blank

E. Tips for True-False

all part must be true
statements with words such as all, always, and never are usually true
statements with words such as some, frequently, often are usually true

F. Essay

make brief outline before writing
begin your answer direct and to the point
support each point you make
do not ramble
neatness helps
write legibly

G. Test Anxiety

physical signs: sweating, nausea
cognitive signs: going blank, clock watching, etc.
coping: recognize the negative behavior it causes
recognize the positive behavior that will result in reduction of the anxiety
relax
direct your attention to the test

Appendix E

Time Record

Subject Area: Study Skills

Profile: Traditional Group-Regular Teacher Instruction

Lesson or Unit	Date Began	Date Completed	Time Spent in Regular Teacher Instruction
# Concentration			
# Memory			
# Test taking			

Profile: Computer (CDI) Instruction

Lesson or Unit	Date Began	Date Completed	Time Spent in CDI Instruction
# Concentration			
# Memory			
# Test taking			

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Appendix F

Personal Questionnaire

QUESTIONNAIRE

NAME _____

1. Index of high school academic achievement: (Please check one). (How would you classify your high school academic achievement record?)

Upper 4th |__|

Upper-Middle 4th |__|

Middle 4th |__|

Below-Average 4th |__|

2. Approximate high school overall grade point average?

3. Approximately college overall grade point average?

4. Current classification:

5. Major? (Please indicate your college)

6. Please indicate your age:

7. Race? (Optional) Please indicate your race:

8. Please indicate your gender:

APPENDIX G

Development of Traditional and Computer-Directed Instruction Teaching (CDI).

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This appendix addresses the development of the traditional study skills content and the computer-directed instructon lessons.

The study skills sections that were utilized in the pre-treatment traditional teaching delivery modes included: memory and concentration. For the treatment phase an additional lesson was prepared entitled "preparing for exams." Lessons were adapted to computer-directed instruction. Both the traditional instructor and the investigator presenting computer-directed instruction agreed that the content was identical--only the methods of delivery differed.

The video and computer lessons were prepared by the investigator and adapted from existing content usually taught in the University of Arkansas, College of Education, study skills sections.

Computer-directed instruction (CDI) was divided into two components: video and computer. The computer component involved a written text, such as the lessons describes as memory, concentration, and preparing for exams. The computer text was carefully planned and spaced to allow the production cost and the computer programmer to cohesively tie the sections into one prepared lesson.

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The computer programmer coded each frame into a carefully planned sequence. Items, such as specific commands and questions, require video playback directed by the computer. A 15-minute lesson required up to 48 hours of computer programming. The total amount of time to interface the video and computer programs was 4 hours.

Each video-cassette required 5 months of production labor and costs. The most time consuming effort involved the preparation of the television studio. Large flats had to be constructed by set designers to allow for a professional appearance of the background area and afford controllable lighting. Setting the lights required several hours of adjusting the portable light props. The slightest change in broadcast position required additional time for re-positioning. Lights were set and changed on a daily basis to afford for camera changes, various positions, and other special effects. Time was set aside in production for lighting adjustments on a daily basis. In addition to the production effects in the actual studio, an engineer and technician were employed to maintain and operate the equipment. Similarly, the cameras were adjusted, along with the engineering

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equipment, on a daily basis. This also required several hours of additional labor. Thus, in a full eight-hour day half of the amount of time was spent in studio preparations. The engineer and technician also engaged in a post-filming, editing operation. In this phase the broadcast film was edited for errors. This process usually involved 4-5 hours per 15 minutes of actual broadcast time. Next, the tape was time-base corrected, another technical process involving 4-5 hours for several short lessons.

The development of the broadcast production involved utilizing a graphic artist and a film technician. Each unit heading and introduction was done on an original graphic. The 35 mm slides were sequenced to the script and had to be carefully photographed to not only visually enhance the production, but also meet the commercial requirements of proper lightness and darkness.

The actual broadcast was given by the investigator. An additional person was needed on camera during the taping. Camera movements, close-ups, movements inward or outward by the camera operator were coordinated among the broadcaster, camera operator, and engineer. The studio script was developed either

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orally, on cue cards, or in written form in order that the production group could cohesively produce the lesson. Coordinating of the camera shots, commands to position various slides and art work on the screen, and the oral presentation required hours of careful planning for each short session of taping.

The video cassette, along with the programmed disc, were combined to form a lesson via (CDI) Computer-Directed Instruction. The interactive drive board allowed the learner to see a video tape, along with a computer lesson on the same screen. The investigator personally devoted over five months of time in the development of the lessons.

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